## REMARKS

Claims 11- 16 and 21 - 32 are pending in the present Application. No claims have been cancelled, amended, or added. Reconsideration and allowance of the claims are respectfully requested in view of the following remarks.

Claim Rejections Under 35 U.S.C. §103(a)

Claims 11 – 16 and 21 – 32 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent No. 6,036,827 to Andrews, et al., in view of Japanese Patent No. JP 401066537 A to Ono, et al., as evidenced by U.S. Patent No. 6,006,582 to Bhandari, et al. Applicants respectfully traverse this rejection.

The Examiner concedes that Andrews et al. fail to teach

> calibrating a hydrogen gas detector by passing a hydrogen-free gas through a first conduit to the hydrogen detector, wherein the hydrogen gas detector generates a first signal; flowing a known quantity of hydrogen gas from a hydrogen/water separator through a second conduit to the hydrogen gas detector, wherein the hydrogen gas detector generates a second signal corresponding to a percentage of the hydrogen gas in the mixture; and calibrating the hydrogen gas detector based on the first and second signals.

(Office Action dated May 18, 2006 (hereinafter "OA 05/06"), page 3) Therefore, the Examiner relies upon Ono et al. to teach a method of detecting hydrogen gas in a detector including the step of calibrating a hydrogen gas detector.

It is first noted that Ono et al. fail to disclose the specific calibration processes as disclosed by Applicants, e.g. passing a hydrogen-free gas through a first conduit to the hydrogen detector, wherein the hydrogen gas detector generates a first signal; flowing a mixture comprising a known quantity of hydrogen gas from a hydrogen/water separator through a second conduit to the hydrogen gas detector, wherein the hydrogen gas detector generates a second signal corresponding to a percentage of the hydrogen gas in the mixture; and calibrating the hydrogen gas detector based upon the first and second signals. (Claims 11 and 28) Ono et al. specifically disclose that "a reference hydrogen gas is introduced into the [measuring] cell 9 through a reference hydrogen gas metering device 8 to determine a correlationship between the concentration of hydrogen and an output signal of a hydrogen gas detector 10 beforehand." (Constitution) As such, Ono et al. fail to teach calibrating a hydrogen detector by passing a

hydrogen-free gas through a first conduit to the hydrogen detector and instead merely teach calculating the concentration of hydrogen with a calibration curve formula which correlates the concentration of hydrogen as determined by a gas metering device 8 and the output of a signal of the hydrogen detector. (Constitution) In other words, Ono et al. teach a method to determine how the magnitude of the signal produced on a detector is related to the quantity of hydrogen present using only a hydrogen enriched gas and as such, fail to teach the calibration method as claimed by Applicants.

The Examiner contends that

> [i]t would be obvious to one of ordinary skill in the art at the time the invention was made to calibrate a detector using known concentration standards in order to determine that a signal produced by the detector is accurate for the known standard.

(OA 05/06, page 4) Applicants note that obviousness is not based upon what an artisan could do or what an artisan may try, but is based upon what an artisan would be motivated to do with an expectation of success. "Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, No. 04-1616 (CAFC March 22, 2006) citing *In re Lee*, 277 F.3d 1338, 1343-46 (Fed. Cir. 2002); and *In re Rouffett*, 149 F.3d 1350, 1355-59 (Fed. Cir. 1998). "When the [Examiner] does not explain the motivation, or the suggestion or teaching, that would have led the skilled artisan at the time of the invention to the claimed combination as a whole, [it is] infer[ed] that the [Examiner] used hindsight to conclude that the invention was obvious." *Id.*

Here, the Examiner relies on a merely conclusory statement, e.g., "[i]t would be obvious...to calibrate a detector...in order to determine that a signal produced by the detector is accurate for the known standard". There is no teaching, suggestion, or motivation to combine the detector of Andrews et al. with the method of Ono et al., and there is no expectation of success. More importantly, Applicants note that even combined, as discussed above, Ono et al. and Andrews et al. fail to achieve the processes claimed by Applicants.

It is noted that, Andrews et al. are directed to a method and apparatus for chemically heating a catalyst bed, e.g., to promptly bring the catalyst bed to light-off temperatures. The system uses an electrolyzer to produce hydrogen for introduction to the catalyst bed. (Col. 7,

lines 33 – 43) They teach the use of a "hydrogen detector 337... placed near the delivery system 10...". (Col. 21, lines 27 - 31) There is no teaching or suggestion in these sections of Andrews et al. cited in the OA 05/06 that the hydrogen detector is calibrated, or that it is in fluid communication with any portion of the system (e.g., designed so that a known quantity of hydrogen gas can flow from the hydrogen/water separator to the hydrogen gas detector as is claimed in the present application). Andrews et al. only disclose electrical communication of the hydrogen detector with the system. Hence, to use anything other than a manual calibration (e.g., spray gas into the detector for calibration) would require physical redesigning of the system of Andrews et al. from the teaching (no motivation).

Furthermore, as discussed above, Ono et al. fail to "teach a method of detecting hydrogen gas in a detector including the step of calibrating a hydrogen gas detector" as disclosed by Applicants. (OA 05/06, page 3) Applicants specifically teach "calibrating the hydrogen gas detector" (Claim 11) by determining a hydrogen free signal and a signal of hydrogen gas of known concentration. Applicants specifically teach "calibrating the hydrogen gas detector based upon the first and second signals". (Claim 11) Ono et al. do not teach the presently claimed method but teach using a calibration curve formula using a previously stored output signal to determine a concentration of hydrogen. (Constitution)

Therefore Andrews et al., even if combined with Ono et al., fail to disclose all of these elements of Applicants' claims. The Examiner further contends that

> [i]ntroducing a hydrogen-free gas provides a low-end signal value for calibration. Using air as the hydrogen free gas would be obvious to a skilled artisan as the baseline value as hydrogen is generally not a component of air.

(OA 05/06, page 4) However, the Examiner's suggestion, i.e. using a hydrogen-free gas as the "reference *hydrogen* gas" in the process disclosed by Ono et al., would seemingly defeat the intended function of the gas as disclosed by Ono et al. Ono et al. discloses a reference hydrogen gas "to determine the correlationship between the concentration of hydrogen and an output signal of a hydrogen gas detector..." (Constitution) By substituting a hydrogen-free gas, as suggested by the Examiner, it is believed that the intended function would be defeated because a hydrogen-free gas would produce an extremely small signal (or no signal) in a hydrogen detector and therefore could not be used to determine the "correlationship" between the hydrogen concentration and the magnitude of the output signal of the detector. In other words, how would

"no signal" enable the determination of a correlationship beetween the concentration of hydrogen and the signal of the hydrogen detector? In this regard, the courts have held that "[i]f the proposed modification would render the prior art invention being modified unsatisfactorily for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon* 733 F. 2d 900, 221 USPQ 1125 (Fed. Cir. 1984). There is no teaching or suggestion to use a hydrogen-free gas as the reference gas. Furthermore, as discussed above, it would require a redesign of the disclosed method because the reference gas metering device 8 is in communication with a hydrogen source 6. (Fig. 3)

The Examiner further relies upon Bhandari et al. to allegedly teach "hydrogen sensors used for detecting hydrogen concentrations in devices... which require calibration..." (OA 05/06, page 4). However, Bhandari et al. fail to disclose the calibration method as claimed by Applicants. (Col. 2, lines 3-15) Specifically, Bhandari et al. merely teach obtaining "the baseline resistance (or conductivity) of the MOS sensor in 'clean air'... by calibration". (Col. 2, lines 3-5) Bhandari et al. teach establishing the baseline resistance so as to detect a decrease in resistance of the MOS material when certain toxins come in contact with the sensor. (Col. 2, lines 3-10) Bhandari et al. fail to teach the actual method by which to calibrate the MOS detector to obtain the baseline resistance. The mere fact that a baseline resistance in "clean air" is first established does not motivate an artisan to calibrate the hydrogen detector of Andrews et al. as disclosed by Applicants, to redesign system of Andrews et al. to locate and operate the detector as presently claimed, or to pick and choose elements of Ono et al. to modify Andrews et al. A skilled artisan would have no motivation to combine the process of obtaining "the baseline resistance (or conductivity) of the MOS sensor in 'clean air'... by calibration" with the un-calibrated detector of Andrews et al. Furthermore, even combined, as discussed above, the Applicants' claims are not obtained. Furthermore, Bhandari et al. disclose that the MOS sensors have "operational deficiencies... [i.e.] [t]hey require frequent calibrations (e.g., approximately every 3 months for current commercially available models)" and do not disclose a method (e.g., the method claimed by Applicants) to resolve this limitation. It is noted that Applicants designed their process to resolve limitations such as frequent manual calibrations.

Here, the Examiner has provided merely conclusory motivation, i.e. that "[m]easuring a larger number of known concentration points in the calibration of a detector will give a more

accurate calibration of the detector over a broader range of concentrations", and there is no suggestion of how or why a baseline resistance calibration can be combined with the detector disclosed in Andrews et al. when taken with Ono et al. The purpose of obtaining the baseline resistance is to detect a decrease in resistance of the MOS material when certain toxins come in contact with the sensor. Hence there is no motivation to combine, or suggestion of how to combine the calibration of the baseline resistance as referenced by Bhandari et al. with the method of Ono et al. (which utilizes a reference hydrogen gas to generate an output signal) or with the un-calibrated detector of Andrews et al.

Additionally, even with the alleged teaching of Bhandari et al. and Ono et al., it is admitted that the references fail to teach flowing a known quantity of hydrogen gas from a hydrogen/water separator through a second conduit to the hydrogen gas detector. (OA 05/06, page 5) As a result, with no motivation besides the present application, the Examiner contends that

> One of ordinary skill in the art would recognize that a source of hydrogen gas is available from the hydrogen system taught in Andrews et al. where hydrogen is collected with a hydrogen/water separator and that the quantity of sample gas would be determined in the measuring device taught in the Ono system in order to provide a known quantity of hydrogen to calibrate the system as taught by Ono.

(OA 05/06, page 5) Applicants maintain that the Examiner has used an improper standard in arriving at this rejection, based on improper hindsight, which fails to consider the totality of the cited references. More specifically the Examiner has used Applicants' disclosure to select portions of the cited references to allegedly arrive at Applicants' invention. In doing so, the Examiner has failed to consider the teachings of the references as a whole in contravention of section 103. There is no motivation or expectation of success to combine Ono et al. with Andrews et al. as suggested in OA 05/06. Andrews et al. teach a hydrogen-water separator in communication with the cathode flow field and provide no motivation to use the hydrogen collected as a reference gas. Furthermore, the Examiner states in response to Applicants' amendment to the Office Action dated December 15, 2005, hereinafter "OA 12/05", that because "...the water separator is a means known in the art for dehumidifying a gas... passing the gas through a hydrogen/water separator [is] obvious based on the teaching of Ono". (OA 05/06, page 7) However, Applicants do not teach "passing the gas through a hydrogen/water separator" but

instead teach "flowing a known quantity of hydrogen gas *from* a hydrogen/water separator through a second conduit...". (Claim 11) Therefore the fact that Ono "teach that the gas is dehumidified" (OA 05/06, page 7) is irrelevant and does not render Applicants claims obvious. As such, no *prima facie* case of obviousness has been established.

Applicants further note that Claim 13, 25-27 and 31-32 depend on patentable claims, e.g., 11, 21, and as such are, by definition, allowable. Furthermore, Applicants respectfully disagree with the Examiner's contention that "Ono teaches calibrating a hydrogen gas detector" for at least the reasons discussed above. (OA 05/06, page 6)

While the Examiner contends in response to Applicants remarks to OA 12/05, that "Ono teaches calibrating a hydrogen gas detector by passing an air pump sample gas through a first conduit to the hydrogen detector wherein the hydrogen gas detector measures a first value" (OA 05/06, page 7), Applicants respectfully disagree. Ono et al. teach "...the sample gas carried on the carrier gas flows into and passes through the cell 9" after "[a] reference hydrogen gas is introduced into the cell 9 through a reference hydrogen gas metering device 8 to determine a correlationship between the concentration of hydrogen and an output signal of a hydrogen gas detector 10 beforehand." As discussed above Ono et al. do not teach using a sample gas and a reference hydrogen gas to calibrate the hydrogen gas detector as alleged by the Examiner. Instead, Ono et al. teach establishing a correlationship with a calibration curve and then calculating the hydrogen concentration of the sample gas by a calibration curve formula with an output signal of the detector previously stored in a data processor. (Constituation)

It is not relevant what artisans could do, but what an artisan would be motivated to do with an expectation of success. That is, it is not relevant if an artisan could calibrate the hydrogen detector of Andrews et al., or if the artisan could redesign the system of Andrews et al. to calibrate in the fashion taught in Ono et al., or if the artisan could redesign the system of Andrews et al. to access hydrogen gas for calibration from a different source and to calibrate in a different manner. What is relevant, is what an artisan would be motivated to do, with an expectation of success, from the teachings of Andrews et al. and Ono et al. Here, there is no motivation to combine and no expectation of success to combine the references of record as suggested, and even combined as suggested, the references fail to render the present claims

obvious. No *prima facie* case of obviousness has been established. Reconsideration and withdrawal of this rejection are respectfully requested.

It is believed that the foregoing remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and withdrawal of the rejections and allowance of the case are respectfully requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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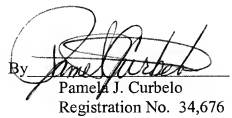
By 
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